

REMARKS

I. Introduction

Independent Claims 1, 17, and 27 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the proposed combination of U.S. Patent No. 6,708,055 to Geiser et al., U.S. Patent Application Publication No. US 2004/0077952 to Rafter et al., and U.S. Patent Application Publication No. US 2003/0016852A1 to Kaufman et al. Applicants respectfully request reconsideration and withdrawal of these rejections because the proposed combination does not teach each and every element recited in the claims. Also, one skilled in the art would not have been motivated to make the proposed combination.

II. The Proposed Combination Does Not Teach Each and Every Element in the Claims

Independent Claims 1, 17, and 27 each recite elements relating to displaying, in a first display area, a moving medical image of a beating heart comprising a sequence of image frames and displaying, in a second display area, a plurality of image frames of the sequence of image frames of the medical image acquired at end-diastolic (ED) and end-systolic (ES) portions of the beating heart's cycle. In the Office Action, it was admitted that Geiser et al. does not teach displaying a plurality of image frames acquired at end-diastolic (ED) and end-systolic (ES) portions of a beating heart's cycle. By virtue of the prior § 102 rejection based on Kaufman et al. being withdrawn, the Office Action also admitted that Kaufman et al. does not disclose this element. Rafter et al. was relied upon to cure these deficiencies, but Rafter et al. also does not teach this element.

The Abstract, Figure 7A and paragraphs 89 and 93 of Rafter et al. were cited as purportedly teaching the admittedly-missing element. However, none of these cited portions teach displaying a plurality of image frames acquired at end-diastolic (ED) and end-systolic (ES)

portions of a beating heart's cycle. The Abstract mentions an operator interface configured to receive an operator preference for spatially arranging a plurality of images. Paragraph 89 mentions that one of the buttons on the operator interface (the end-systolic pushbutton 761) displays images acquired at end of systole and that another button (the end-diastolic pushbutton 763) displays images acquired at end of diastole. Accordingly, Rafter et al. merely teaches the use of the end-systolic pushbutton 761 and the end-diastolic pushbutton 763 to view image frames at the *same portion* of the cardiac cycle — *either* at end of systole (when the end-systolic pushbutton 761 is pushed) *or* end of diastole (when the end-diastolic pushbutton 763 is pushed). This is even how the Examiner characterizes the teaching of Rafter et al.: "it is often desirable to and useful to observe and compare multiple images of the heart at the *same portion* of the cardiac cycle." June 20, 2007 Office Action, page 3 (emphasis added). However, independent Claims 1, 17, and 27 each recite elements relating to displaying a plurality of image frames of the sequence of image frames acquired at both end-diastolic (ED) and end-systolic (ES) portions of the beating heart's cycle. Accordingly, while independent Claims 1, 17, and 27 recite displaying image frames acquired at *different* heart cycles (end-diastole and end-systole), Rafter et al. (and, hence, the proposed combination) only teaches displaying image frames acquired at the *same* heart cycle (either end-diastole or end-systole).

In summary, because Rafter et al. does not cure the admitted deficiency in Geiser et al. and Kaufman et al., the proposed combination fails to render independent Claims 1, 17, and 27 unpatentable. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejections against independent Claims 1, 17, and 27 and their dependent claims.

III. Lack of Motivation to Combine Geiser et al., Rafter et al., and Kaufman et al.

Applicants further submit that one skilled in the art would not have been motivated to combine Geiser et al., Rafter et al., and Kaufman et al. because Kaufman et al. teaches away from such a combination.

Kaufman et al. is directed to a system in which still images (or slices) of an organ are acquired and displayed. The still images are used to construct a three-dimensional composite image. With reference to the user interface in Figure 2 of Kaufman et al., the selected image 42 is a still image (or slice) of a heart, and images 56 and 58 represent the previous and next slices to be shown in area 42. The images in areas 48 and 50 are image projections of selected slices, with the image in area 48 representing a projection made from all of the slices in the image, and the image in area 50 representing a projection made from only selected image slices.

Because Kaufman et al. desires to obtain and display a still image of the heart, Kaufman et al. views heart motion as noise that will cause blurring of the image. Kaufman et al. recognizes that the blurring of an image is most likely to occur during systole, where the heart is in motion, and less likely to occur during diastole, where the heart is relatively motionless. To take advantage of these conditions, Kaufman et al. uses a gating function so as to only use the still images taken at diastole, where the heart is relatively motionless, and not at systole, where the heart is in motion. As such, Kaufman et al. teaches against the combination with Rafter et al., which was relied upon for its teaching of displaying images at systole. Under the proposed combination, the addition of Rafter et al. would introduce the very problem that Kaufman et al. is specifically trying to avoid. Because of this, one skilled in the art would not have been motivated to combine the references as proposed in the Office Action.

IV. Conclusion

In view of the foregoing remarks, Applicants respectfully submit that this application is in condition for allowance. Reconsideration is respectfully submitted. It should be noted that while only some elements of the independent claims were discussed above, other elements of the independent claims, as well as the dependent claims, provide additional grounds of patentability. Applicants reserve the right to present these additional grounds at a later time, if necessary.

If there are any questions concerning this Response, the Examiner is invited to contact Joseph F. Hetz (Reg. No. 41,070) at (312) 321-4719.

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